

**Title:** Establishing a Cohesive Engineering Curriculum Supporting NASA Avionics Development and Careers  
**Institution:** Prince George's Community College  
**City/State:** Upper Marlboro, MD  
**PI:** Scott Johnson

Summary: Prince George's Community College (PGCC) seeks NASA support to enhance and innovate within its existing engineering curricula, a cohesive curriculum supporting NASA avionics technology and advanced development. The program will coordinate instruction between engineering, science and mathematics courses typically taken by first and second year engineering students nationwide. NASA recognizes the important role of community colleges in preparing engineering students. We believe that this proposal can indeed build an engineering curriculum that will allow students to enter four year engineering programs better prepared and able to graduate faster with lower costs. Engineering programs including those at four year schools are confronted by students requiring substantially more than four years to graduate. Through this proposal, STEM courses will be redesigned to emphasize relevant material for engineering students who are more mathematically and computer sophisticated than others taking introductory courses. This project will support acquisition of sophisticated software and hardware appropriate to the NASA workplace and modern engineering in general, to be used in these courses. A new course surveying avionics technology and advanced development aligned with NASA/Goddard Space Flight Center (GSFC) will be created, offered, and piloted in fall 2019. PGCC, located in suburban Washington DC, is a minority serving community college just a few miles from GSFC. PGCC and the proposal team have strong links to GSFC. The PI, Prof. Scott Johnson is the coordinator of the PGCC engineering program. He worked as a contractor at GSFC for ten years as a systems engineer and scientist. The Co-I, Prof. Neeharika Thakur, also worked at GSFC as a research astrophysicist and continues to collaborate there today. GSFC scientists teach science courses at PGCC as adjuncts, and we expect opportunities will arise for other GSFC scientists and engineers to collaborate. This proposal leverages these relationships to broadly improve PGCC engineering curricula. It will include research internships for PGCC students at GSFC. Students will be recruited through the NASA Internship System with the cooperation of GSFC. An opportunity to cooperate with NASA engineers and scientists will increase student interest in NASA avionics development, space science, and engineering in general, enhancing recruitment of STEM students who will be motivated to pursue NASA careers. Our experience is that returning interns convey their experiences to fellow engineering students spreading interest across the school. The cost of books today is close to the cost of community college tuition. The PGCC team will create open free online textbooks, lab manuals,

and other materials which can be used at community colleges and four year institutions nationwide. Through this proposal, PGCC will enhance and innovate within its existing engineering curriculum to create a cohesive engineering curriculum with a strong NASA avionics content that will train the future NASA workforce. If successful, the program, evaluated by Dr. James Lookadoo an ABET certified team leader, will be useful nationwide. Due to its close proximity to NASA/GSFC, past and current NASA affiliations of the proposal team, and demonstrated success in mentoring PGCC students as interns at NASA and elsewhere, we can say that minority-serving PGCC is in a perfect position to successfully carry out the proposed task.